JPRS 78378

24 June 1981

Worldwide Report

ENVIRONMENTAL QUALITY

No. 311

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available from Bell & Howell, Old Mansfield Road, Wooster, Ohio 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS 78378

24 June 1981

WORLDWIDE REPORT

ENVIRONMENTAL QUALITY

No. 311

CONTENTS

WORLDWIDE AFFAIRS

Briefs

GDR-Swedish Environment Protocol 1

ASIA

AUSTRALIA

Victoria Rejects Request for Logging in Catchments
(Stephen Johnston; THE AUSTRALIAN, 1 May 81) 2

States Have Diverse Plans for Murray Salinity Control
(Philip Cornford; THE AUSTRALIAN, 12 May 81) 4

Briefs

Salinity Committee 6
Tasmania Hydroelectric Ban 6
New Murray River Row 6

BANGLADESH

Erosion of Sanka River Makes Thousands Homeless
(THE BANGLADESH TIMES, 24 May 81) 7

PEOPLE'S REPUBLIC OF CHINA

Pollution Control Efforts in Taiyuan, Shanghai Reported
(SHANXI RIBAO, 15 Apr 81, WEN HUI BAO, 11 Mar 81) 9

Taiyuan Industrial Pollution Control, by Sun Zhongying
Shanghai Drinking Water Quality

Measures to Broaden Acid Rain Monitoring Proposed
(Bu Changchun; HUANJING, 28 Feb 81) 11

LATIN AMERICA

CUBA

Water Contamination, Cleanup in Arroyo Naranjo Noted
(Jesus Soto A.; JUVENTUD REBELDE, 3 May 81) 13

SUB-SAHARAN AFRICA

INTER-AFRICAN AFFAIRS

Cameroonian 'Secret' Dam Called Threat to Nigerian Water
(Sani Haruna; NEW NIGERIAN, 28 May 81) 15

ETHIOPIA

Briefs

Shoa Region Drought 17

NIGERIA

Economy of Onitsha Said Threatened by Erosion
(Chris Nwegbo; DAILY TIMES, 26 May 81) 18

Storms Cause Heavy Property Losses
(NEW NIGERIAN, various dates) 20

Gongola State, by A. B. Tapidi
Sokoto State, by Adebisi Adekunle
Cross River State, by Gregory Umari Mgbado

Storms, Drought Destroy Property in Bauchi
(NEW NIGERIAN, 29, 30 May 81) 22

Nearly 2 Million Affected, by Yaro Ali
Property Worth Thousands

Goronyo Dam To Displace 29,000 People
(Ibrahim N. Salihu; NEW NIGERIAN, 22 May 81) 24

Proposed Dam To Displace 70,000 People
(Mohammed Salau; NEW NIGERIAN, 30 Apr 81) 25

ZIMBABWE

Discussion of DDT Dangers 'Alarming'
(Editorial; THE SUNDAY MAIL, 31 May 81) 26

USSR

Advances Made in Earthquake Prediction
(O. Bobrakov; KRASNAYA ZVEZDA, 8 Mar 81) 27

Active Kurile Area Volcano Studied
(V. M. Surgrobov Interview; TRUD, 6 May 81) 31

Start of USSR Sea Study Project Announced
(A. Androshin; PRAVDA, 12 May 81) 33

Soligorsk Mine Wastes Converted Into Mineral Fertilizers
(I. Novikov; PRAVDA, 12 May 81) 34

Book on Environmental Protection Reviewed
(A. Bulkin; PLANOVOYE KHOZYAYSTVO, Mar 81) 38

BRIEFS

GDR-SWEDISH ENVIRONMENT PROTOCOL--Stockholm, 4 Jun (ADN)--Deputy chairman of the GDR State Council and Minister for Environmental Protection and Water Conservancy Dr Hans Reichelt and Minister of Agriculture Anders Dahlgren on Thursday in Stockholm signed a protocol on long-term cooperation in environmental protection between the GDR and Sweden. This brings to an end Dr Reichelt's 5-day visit to Sweden. Under the protocol both sides agree to concentrate primarily on measures for the protection and rational utilization of water, especially the protection of the Baltic and water treatment. [Text] [LD050300 East Berlin ADN International Service in German 1559 GMT 4 Jun 81]

CSO: 5000/2132

AUSTRALIA

VICTORIA REJECTS REQUEST FOR LOGGING IN CATCHMENTS

Canberra THE AUSTRALIAN in English 1 May 81 p 4

[Article by Stephen Johnston]

[Text] The Victorian Government has rejected demands from the timber industry to open the State's water supply catchments for logging.

The Premier, Mr Hamer, said yesterday the Government had concluded that logging in the catchments would have a detrimental effect on the quantity and quality of Melbourne's water.

Mr Kamer and the Minister for Water Supply Minister, Mr Granter, said Melbourne's water supply was one of the best in the world.

"The Government will not permit any action which would cause Melbourne's water from the catchments to require treatment or filtration," they said.

The decision brought an angry response from the Forest Industries Research Management.

The group's chairman, Mr Tory Gunnerson, said it was a political decision which ignored independent studies supporting logging.

"It's not true that Melbourne's water will require treatment or filtration if the water catchments are open to logging and recreation," he said.

The attraction in the catchments for the timber industry is more than 45,000 hectares of eucalypt forest including large areas of the last remaining mature mountain ash in Victoria.

The FIRM group estimate that timber in the catchments could yield royalties of $3 million a year with a wholesale annual value of timber and pulp of $19 million.

Mr Hamer said that even under the most stringent logging controls, Melbourne would lose about 13,300 megalitres of water a year for up to 40 years.

The main loss would be in the heavy demands of the young regenerating forest after logging.

The Board of Works is also concerned that road construction and an increased number of people in the catchment areas would lead to a severe long-term decline in water quality.

Treatment and filtration plants would cost hundreds of millions of dollars to construct.

The Government's decision will receive strong support from conservationists.

The catchment areas contain most of the habitat for Victoria's emblem, Leadbeater's possum, which has rapidly declined in numbers because of the depletion of Victoria's mature mountain ash reserves through fires and logging.

CSO: 5000/7571

STATES HAVE DIVERSE PLANS FOR MURRAY SALINITY CONTROL

Canberra THE AUSTRALIAN in English 12 May 81 p 7

[Article by Philip Cornford]

[Text]

SOUTH Australia is poisoning itself. The driest State on the driest continent provides within its own boundaries one third of the salt load which is polluting its most vital source of water, the Murray River.

An average annual load of 1.1 million tonnes of salt flows across into South Australia, collected during the 1893km the Murray flows through NSW and Victoria.

But in the 637km the Murray flows in South Australia it collects another 470,000 tonnes of salt in a year of average flow. It is inside South Australia that the salinity of the Murray really starts to rise — and, regrettably and as is the case all along the Murray, the bulk of this salt is man-made.

South Australia irrigates only 43,000ha of Murray Valley land — but bad irrigation practices and run off wash 200,000 tonnes of salt into the river.

The Murray experiences its heaviest regulation within South Australia — there are six weirs above the pipeline which extracts water for Adelaide — and the reverse hydraulic effect these man-made lakes exert on highly saline underground water pushes another 120,000 tonnes of salt into the river a year. Another 150,000 tonnes comes from natural inflows.

And 300,000 tonnes of this salt is pumped straight back onto the land each year by flood irrigation farming.

DRAINAGE

Worse, the problem was exacerbated by attempts to reduce salt loads in the river. A Murray River Commission report states: "At present, approximately half of the salt inflow due to irrigation drainage is from the evaporation basins. With the expansion of drained areas, this component is expected to increase by nearly 70 per cent by the year 2010."

These evaporation basins were located adjacent to the river, spilling highly saline water, oozing it underground. Their locations reflected — in fact, it is an indictment — South Australia's unwillingness to spend money on a resource it took for granted.

Clearly South Australia, the State which with good reason yells the loudest about Murray River salinity and water flows, had equally good reason to get its own house in order.

Belatedly — it is well to remember that it is now 13 years since the disastrous summer of 1967-68 when only 1.58 million megalitres of water went down the Murray, less than one-sixth its average annual flow — it is doing just that.

It is spending $80 million, with more to come, and the scale of the work indicates how sensitive a political problem the Murray has become to 1.3 million South Australians who rely on the river to deliver up to 82 per cent of their domestic and industrial water in a dry year.

The program:

● $15.1 million to extract 157,000 tonnes of salt a year by draining three overloaded and riverside evaporation basins into a new evaporation basin at Noora, well removed from the Murray. Work started last year and is scheduled to be finished in 1983.

● $24.6 million in the Berri irrigation area to replace open drains which deliver irrigation water from the Murray to farms with closed pipelines. Work is to finish in June 1983.

● $20 million on a similar scheme in the Cobdogla irrigation area, work to finish in 1985.

● $23 million to rebuild the on-farm tile drainage works in the Berri-Cobdogla areas. The drains, which are collapsing with old age, carry run-off irrigation water to the evaporation basins which will eventually feed into Noora.

It is interesting to note that the great bulk of the money — $67.6 million — is being spent on projects where the primary aim is to protect the land, not the river, from salinity.

The chief beneficiary is the farmer, who is in fact the major polluter. These projects protect the river only in a secondary role, and far less effectively than the salt extraction scheme.

The same preference is noticeable in Victoria and NSW, which again reflects the political realities of both States. Rivers don't vote, but farmers do.

In Victoria, the Government has spent or is spending $6 million on salt extraction and is spending and planning to spend $12.4 million on saving land in the Shepparton region by pumping down underground salt tales.

The salt extractions in Victoria — the second major polluter of the Murray — will total 88,500 tonnes of salt a year compared with its intention to eventually pump 142,000 tonnes of salt a year into the Murray to save the Shepparton land, a deplorable deficit if it is permitted to occur.

In NSW, the Government has spent $370,000 extracting 19,000 tonnes of salt a year at Buronga and is planning to spend $12 million to save land at Wakool from saline groundwater. This scheme, however, will also extract 25,000 tonnes of salt.

NSW smugly claims it contributes only 10 per cent of the Murray River salt load, but this does not take into account salt which comes down the Darling River, on which the Menindee Lakes storage is administered not by NSW, but by the Murray River Commission.

South Australia says that a monitoring program showed that 115,000 tonnes of salt came down the Darling into the Murray from August 6 to January 20, 39 per cent of the total salt to enter South Australia in that period. In the month of January, it went up to 64 per cent.

No matter how you feel about these semantics, it is still salt down the Murray. The Murray River Commission's contribution is the $3 million Rufus River scheme to extract 27,000 tonnes of salt a year from this outlet from Lake Victoria, where water for South Australia is held in storage.

The end result is that Victoria, NSW and the Murray River Commission will extract from the Murray 150,000 tonnes of the 1.1 million tonnes of salt they send into South Australia each year. They could do more and, given the right sort of pressure, probably will.

While South Australia's Noora salt extraction scheme will single-handedly almost outstrip them, Victoria and NSW can at least claim — as they do every time they are challenged on this — that they took the initiative first, well ahead of South Australia.

Altogether, these schemes are expected to lower the salinity readings at Morgan, the main pumping outlet in South Australia, by about 80 EC units.

They will mean that South Australia will have potable water below the World Health Organisation standard of 800 EC units 97 per cent of the time, compared with 75 per cent of the time now.

Had they not gone ahead, South Australians by the year 2010 would be getting potable water only 47 per cent of the time. The damage to crops and industry in that time would have totalled more than $80 million.

They are, however, no more than "bandaids", quick solutions to a problem that had been allowed through neglect to get well out of hand. Their beneficial effects will have been eroded or destroyed by 2010.

Eventually, the four governments — South Australia, Victoria, NSW and the Federal Government — who govern the fate of Australia's greatest waterway are going to have to come up with more salt extraction schemes or another form of solution.

The one the South Australians want to see is more water sent down the Murray in dilution flows.

They are looking at the Darling River, the Murray's biggest tributary, with jealous eyes.

And NSW is ready to fight.

CSO: 5000/7571

BRIEFS

SALINITY COMMITTEE--The WA Government has announced the members and terms of reference of a committee to advise it on protection of agricultural lands from salinity and other soil degradation. The members are the Director of Engineering, Mr R. Hillman, the Conservator of Forests, Mr B. J. Beggs, the Director of Agriculture, Mr E. N. Fitzpatrick, the director of the Department of Conservation and the Environment, Mr C. Porter, the chairman of the research steering committee, Dr M. Mulcahy, and the Commissioner for Soil Conservation, Dr G. Robertson. Their terms of reference are to advise a Cabinet subcommittee on: Management policies and legislative arrangements for salinity and soil-erosion control. The funding requirements of their proposals. Investigation of the procedures used by farmers to combat salinity and erosion. The Premier, Sr Charles Court, said that a review of the Soil Conservation Act had started. [Text] [Perth THE WEST AUSTRALIAN in English 29 Apr 81 p 13]

TASMANIA HYDROELECTRIC BAN--Hobart.--The Franklin and Lower Gordon rivers, in Tasmania's south-west wilderness, are now part of a national park. The State Government proclaimed the park yesterday and moved to have it included on the world heritage list. This effectively prevents any hydro-electric power development on the rivers--the subject of one of Australia's biggest conservation campaigns--and creates a huge national park stretching from Tasmania's south coast, through the existing South-West national park and connecting with another big national park, the Cradle Mountain-Lake St Clair Park, in the central highlands. It took only an Executive Council proclamation to create what will be known as the Franklin-Lower Gordon Wild Rivers National Park. But it will need approval of both Houses of Parliament to rescind it. [By Garry Bailey] [Excerpt] [Melbourne THE AGE in English 1 May 81 p 18]

NEW MURRAY RIVER ROW--The South Australian Government has warned that the livelihood of at least one million people would be jeopardised if the NSW Government perseveres with its plans to develop 250,000 ha of land for irrigation from the River Murray. It claims the need for a moratorium on all further irrigation from the river was clearly highlighted by the fact that the Murray has stopped flowing into the sea for the first time in memory. A giant sand-bar spanning 2km of the river mouth at Goolwa in South Australia has built up in the past week, blocking water flow into Encounter Bay and trapping stale water in the lower river system. Experts on the crucial waterway claimed yesterday the blockage had to be cleared immediately or the water from the southern reaches would become undrinkable. The increasingly stale water now locked in the river by the blockage is still being directly channelled into the water supplies of Adelaid and nearby centres. [By Peter Blunden] [Excerpts] [Canberra THE WEEKEND AUSTRALIAN in English 2-3 May 81 p 2]

CSO: 5000/7571

EROSION OF SANKA RIVER MAKES THOUSANDS HOMELESS

Dacca THE BANGLADESH TIMES in English 24 May 81 p 5

[Text] Patiya, May 23: About 600 dwelling houses have been washed away rendering thousands of people homeless by the massive erosion of the mighty Sanka river in different places of the subdivision during the last few years.

Constant erosion has washed away a vast tract of paddy growing land in Khagaria Baitali Za[illegible] Maishamura Dharmapur Kalyish Bazalia, Chagachar and Barudkhona.

Siltation results in the overflowing of the river and consequent damage to crops on both sides in the event of floods every year. Seven miles of embankment along the river Sanka from Bazalia to Bailtali are now being threatened severely by the erosion. In Bazalia and Bashara Nagar the erosion has taken a serious turn.

Meanwhile, the holy shrine of Hazrat Syed Jalaluddin Misri (RA) has partly been devoured by the river. If present state of erosion continues unchecked, the entire shrine will disappear in very near future.

Marooned people are passing their days in hardship. Their proper rehabilitation is urgently needed.

During the last ten years a dozen of Ministers visited the affected areas and saw the trial of damages left by the unabated erosion. [as published]

People of the localities have urged the athorities concerned to take effective measures in this respect in order to check further erosion of the Sanka. [as published]

Compensation

Another report adds: A number of peasants have not yet received 20 per cent compensation against Government acquired land measuring an area of 102 acres for Baitul Izzat (beggars rehabilitation centre) at Keochia under Satkhania [illegible] since over two decades.

It is learnt that the then Pakistan Government had drawn up a scheme in 1958 for setting up a rehabilitation centre for the beggars at Keochia which was rechristened as Baital Izzat. Accordingly, 102 acres of land including some hillock belonging to 68 peasants were acquired and 80 per cent compensation had been paid by the Government.

In 1966, 34 buildings including staff quarters hospitals auditorium club power house etc were constructed on the land. The beggars who were admitted in the institution ultimately fled away and afterwards it fell vacant for a long time, in 1976, the Baitul Izzat was converted into headquarters of 23rd Wing of Bangladesh Rifles (BDR) and in 1980 it was transformed into a training school for the BDR personnel.

The peasants have urged the authorities concerned to pay the remaining compensation as soon as possible.

Police Outpost

The people of east Satkania and West Banshkhali have urged the Government to immediately set up a permanent police outpost at Chankhola Mountain Pass in order to save lives and properties of passengers and pedestrians Mr Hafez Ahmed Chowdhury, Chairman Keochia Union Parishad told TIMES that he would provide necessary land for the proposed police outpost free of cost.

Mr Jamaluddin Ahmed, Deputy Premier last year assured that a permanent police outpost at Chankhola between Satkania-Banshkhali police stations would be set up. He was addressing a public rally at Banshkhali. Four members of parliament from Banshkhali Satkania, Chandanish and Anaara appealed to the authorities concerned to do the same in public interest. It may be tooted here that Chankhola is a hilly area and the distance from Satkania and Banshkhali thana is 12 to 15 miles. Robbery, pilferage and hijacking are regularly being committed in this mountain pass in almost every day night. [as published]

Allocation

The Government has allocated Taka 40 lakh for the construction of Banshkhali portion of Patiya-Anwana Banshkhali road this year. Mr Mahmudul Islam, MP inaugurated the work recently before a large gathering.

CSO: 5000

PEOPLE'S REPUBLIC OF CHINA

POLLUTION CONTROL EFFORTS IN TAIYUAN, SHANGHAI REPORTED

Taiyuan Industrial Pollution Control

Taiyuan SHANXI RIBAO in Chinese 15 Apr 81 p 2

[Article by Sun Zhongying [1327 0112 5391]: "More Industrial Pollution Under Control in Taiyuan City"]

[Text] Since last year the industries and enterprises of Taiyuan city have made serious efforts in their pollution control and environmental protection activities and have achieved good results. Statistics shows that 225 of the 380 pollution control projects in the more than 400 county-operated enterprises in Taiyuan city are now completed and are in operation. Industrial waste gas processing capacity has increased by 8.4 million cubic meters per day and industrial sewage processing capacity has increased by 40,000 tons per day. The value of various types of recovered industrial material is 5.35 million yuan per year.

With an investment of 5.26 million yuan last year, the Taiyuan Steel Company completed 17 pollution control engineering projects and solved some major chronic difficult problems. The coal gas recovery of the No 1 and No 2 blast furnaces not only reduced pollution but also saved 15,000 tons of non-coking coal.

The Taiyuan Chemical Plant made a great effort in controlling the hazardous "one liquid and five gases" and finished five projects in 1980, the best year in pollution control in recent years. In the past, the amount of phenol discharged from the phenol shop sewage at this plant accounted for more than 50 percent of the phenol discharge in the entire city; now the first stage of the phenol processing engineering project has essentially been completed and the phenol content per liter of water has been reduced from 10,000-12,000 mg to the low level of 100-300 mg. The billowing smoke of chlorosulphonic acid tail gas and DDT tail gas in the downtown area are now under control, with the average emission concentration within the national emission standard.

There is also new progress in scientific research into pollution control. Important achievements have been made in absorbent sewage purification at the Xingan Chemical Material Plant, in the treatment of zinc-plating sewage with a three-trough counterflow bleaching process at the Jinxi Machinery Plant, in the new copper purification technology using benzotriazole instead of chromic anhydride developed by the Taihang Meter Plant, and in the cyanogen-containing coal gas sewage purification at the Shanxi Machine Tool Plant. These research achievements have opened up new avenues for pollution control in Taiyuan city.

Shanghai Drinking Water Quality

Shanghai WEN HUI BAO in Chinese 11 Mar 81 p 2

[Text] At the work conference on Shanghai city environmental protection held by the municipal people's government yesterday, it was pointed out that in 1981 the municipal government will insist on carrying out the State Council's decision on reinforcing environmental protection efforts during the period of national economic readjustment. Efforts will be made to solve two problems of the most urgent public concern: deterioration of drinking water quality and conflict between the public and plants on pollution issues. The policy of "making prevention the main theme; treating the symptom as well as the disease but stressing the treatment of symptoms for the time being" will be adopted, and work will begin as early as possible so that environmental protection and development in industry and agriculture of the city can be coordinated.

Deputy Mayor Yang Ti [2799 1029] chaired the conference and Han Zheyi [7281 0772 0001] secretary of the municipal people's council and deputy mayor, addressed the meeting.

The conference expressed the belief that environmental protection agencies at various levels should put their main effort into strengthening management, because it is difficult to carry out large-scale pollution control with the limited financial resources during the national economic readjustment. On-the-spot pollution control should be actively pursued in those units that are in sharp conflict with the public because of serious pollution problems. Control of organic pollutants should also be actively pursued: efforts should be concentrated on the purification and reuse of polluted water, improvement of the quality of drinking water as quickly as possible, and consolidation and advancement of achievements in pollution control obtained thus far. The municipal government has requested the city's environmental protection departments to conduct medium- and long-term planning for the environment of Shanghai based on investigation, scientific research and pollution monitoring.

Because of the emphasis by various leadership officials, the environmental protection work in Shanghai made good progress in 1980. In the course of strengthening the environmental management and carrying out the "Environmental Protection Act," a number of units and groups have done a good job in protecting the environment. At yesterday's conference 26 units, 215 groups and 424 individuals were awarded certificates of merit for their progressive work. The Fenghuo Foundry, Shanghai Bicycle Plant No 3 and the Kangding Street community reported their experience to the conference in oral and written presentations.

9698
CSO: 5000/4066

MEASURES TO BROADEN ACID RAIN MONITORING PROPOSED

Guangzhou HUANJING [ENVIRONMENT] in Chinese No 2, 28 Feb 81 pp 4-5

[Article by Bu Changchun [0592 7022 2504], Science and Technology Department, Environmental Protection Office, State Council: "Everyone Should Monitor Acid Rain"]

[Text] For many centuries, man considered rain and snow as the source of all living things, and accordingly people constantly used such beautiful phrases as "The rain and dew water the grain shoots and make them strong," and "The timely snow foretells a rich harvest" in praise of them. But in this century there is a kind of precipitation which not only cannot produce vigorous crops but actually is an assassin that kills people: it is acid rain.

Precipitation is formed by water vapor which rises to the upper atmosphere and is condensed by cold; in general its pH is between 6 and 7, so that it is relatively pure. The way in which it becomes acid is that the thousands and thousands of tons of sulfur dioxide and nitrogen oxides discharged by industry and transport pollute the atmosphere, and rain and snow concentrate this suspended matter and transport it to areas far from the pollution source, where it falls to earth with the precipitation, producing pollution over an even greater area.

Acid rain occurs everywhere in the world, particularly in Northern Europe, North America and Japan. In the last decade or more, the acidity of precipitation has been increasing steadily. In the United States, for example, the pH of rain recorded in 1939 was 5.9, while in recent years the acidity of the precipitation in the densely populated east and northeast has fallen to 4.0-4.5, or even to 3.0 in some areas. Because of the harm done by acid rain, since 1935 the acidity of lakes in the Adirondack Mountains of New York State has increased a hundredfold, and the pH of many of them is 5 or lower, with the result that 90 percent of the fish have suffered harm. Acid rain also causes the leaves to fall from the trees and decreases yields of wood and agricultural crops; it corrodes old buildings and accelerated their weathering. It also can make pedestrians' eyes and skin sting and threatens human health.

In this country, acid rain has been occurring for a number of years. It has fallen in Taiwan, Hunan, Guizhou, Shandong and Shanghai. A few years ago, after a rainfall in Qingdao, Shandong, tussah silkworms that had been feeding on a large tract of oak trees fell to the ground and died in large numbers. Later the Qingdao municipal environmental protection office found that the culprit was acid rain: the pH of the rain in this case was about 4.

Humanity's existence and development is closely connected with precipitation, and accordingly precipitation is an extremely precious natural resource. It is estimated that every year 100 trillion cubic meters of precipitation falls on the land surface of the earth, and accordingly the fact that it is polluted cannot fail to evoke concern from the countries of the world. Currently, Sweden, Norway, Denmark, Poland, the Soviet Union, Japan, Canada and the United States have established an extensive acid rain monitoring network. Starting last year, the United States made acid rain a critical research topic, and every year the government allocates 10 million dollars for a 10-year comprehensive acid rain evaluation program.

Our country has also been taking note of the increasing acidity of precipitation for some years, but the work is limited to a few cities, which is quite insufficient. In our extensive country, the annual precipitation is more than 6 trillion cubic meters. What amounts of pollutants are there in this large quantity of precipitation? What is the distribution of acid rain in our country and what laws govern it? What effect does it have on the ecology? Is acid rain beneficial for the alkaline soils of the north? None of these questions has yet been clearly answered. As our country's industrial and agricultural production develops, investigation of acid rain should be put on the agenda.

Investigating acid rain is not an easy matter. But the first step, that of carrying out acid rain monitoring and analysis as rapidly as possible is not difficult. First, nearly 400 environmental monitoring stations and research institutes have been set up nationwide; these will be able to take charge of monitoring the acidity, conductivity and other parameters of precipitation, and those which are equipped to do so can also carry out analysis of the chemical components of precipitation. Second, the country also has more than 20,000 meteorological stations, precipitation stations and spare-time meteorological observation groups which not only monitor and analyze precipitation conditions, distribution and quantities, but also can test the acidity of precipitation each time it occurs. In addition there are the country's more than 100,000 middle and higher schools: if they could all organize environmental science groups, make use of the information presented in elementary and intermediate chemistry textbooks, use pH paper, titration, direct recording with pH meters and the like, and mobilize their fellow students to carry out acidity determination of each occurrence of precipitation and send the data and samples to the nearby environmental monitoring station or scientific research institute, the resulting thousands upon thousands of items of data that would be collected and organized would be helpful in determining the laws and characteristics of acid rain in our country and in gaining a more profound understanding of the laws of pollutant migration in the atmosphere. This would be of great importance in determining atmospheric pollutant emission standards, drawing up an environmental and an energy policy for our country, carrying out a more comprehensive and effective agricultural zoning plan and the like.

We hope that the environmental research and monitoring departments will not only do their monitoring work well but will also be able to reach out to relevant departments and schools and mobilize and organize the masses to join with them in effective acid rain monitoring work. We also hope that all you young friends who are concerned about the environment will use all means available to you to test the acidity of each occurrence of precipitation and will record the time, location and acidity data and report them to the local environmental monitoring station or to me personally by the fastest possible method. Let us all be concerned about and protect the precious resource of precipitation, and let us not permit acid rain, this assassin of the people, to become mingled with the precipitation and work its harm at will.

8480
CSO: 5000/4068

WATER CONTAMINATION, CLEANUP IN ARROYO NARANJO NOTED

Havana JUVENTUD REBELDE in Spanish 3 May 81 p 2

[Article by Jesus Soto A. in the column "Correspondence"]

[Text] Residents of the Las Delicias district of Mantilla in Havana's Municipality of Arroyo Naranjo contacted this column to report the situation they are having to cope with as a result of water contamination in that area.

Rosa Perez, who lives at 365 C Street, between Jose Maria Perez and Martires de Giron streets, and is a member of the Frank Pais CDR [Committee for the Defense of the Revolution] No 18 in Zone 20 of that municipality, met with the reporter from "Correspondence."

She said that since the 10th of last month the residents have been noticing a foul smell, cloudiness, and sediment in their running water.

The residents immediately reported the situation to the area's polyclinic so that the appropriate steps would be taken and the problem solved.

Rosa further explained that not long before that, personnel from the Municipal Water and Sewer Enterprise had done some work on the pipes to benefit parts of the district. That, she said, was when the irregularities in the water supply leading to the contamination in question began.

According to women living in the district, the inspection manholes for the water system are located a few blocks away at the corner of Quinta and Julio Sanchez streets, where Segunda Nueva begins.

The place in question is a wide drainage channel that collects very foul-smelling sewage. That center of stench is the source of a permanent plague of mosquitoes.

Sanitation Measures

Dr Augusto Hernandez, director of the polyclinic in Mantilla, told us: "As soon as we were aware of possible contamination in that area, we ordered the usual steps in such cases: boiling the water, inoculating against typhus, and so on." And he added: "The contamination had been known about for 2 weeks when a resident appeared at the polyclinic to report the situation, and I immediately notified the local authorities."

For his part, Rubel Macias, member of the Executive Committee of People's Government in Arroyo Naranjo, said: "The situation in the Las Delicias district immediately engaged the attention of the Municipal Water and Sewer Enterprise and the provincial enterprise concerned, which are now working to resolve it."

He provided us with the report sent by Pablo Garcia Perez on the 27th of this month to the chairman of the people's government in that municipality, who is also a member of the executive committee. The report says that the following steps were taken:

1) Fifty-four samplings of ammonia and residual chlorine were taken; 2) 24 bacteriological analyses were made; 3) the new pipes were insulated from the old pipes; 4) the drains were cleared using flexible tube; 5) four taps were installed at Giralt and Hortensia streets; 6) two others were installed on Quinta Street between Tercera Nueva and A streets; 7) and two more were installed at the corner of Lucero Road and Quinta Street; and 8) a connection providing a direct flow from the contaminated area on Quinta Street was repaired.

Other connections were also repaired, and there are plans to install pipes in the channel carrying the putrid water, which may be one of the direct agents of contamination.

According to the document, the results of the work have been judged positive, since lab tests on the water show that contamination has been reduced.

But during the visit that "Correspondence" made to that district on the 28th, the residents handed us a bottle containing water which still stank and which they are still receiving through the pipes.

They also complained that service from the water trucks was irregular, since there are areas where drinking water has not been delivered for 4 days, and the residents have been forced to use the contaminated water, even though it is boiled.

They also expressed their concern over the cistern at the Oscar Lucero Primary School, which they suspect is also contaminated. We told this to Dr Augusto Hernandez, director of the polyclinic, and he assured us that appropriate steps would be taken.

According to assurances from the member of the executive committee who is responsible for health in Arroyo Naranjo, the work will continue until the situation has been permanently resolved.

11798
CSO: 5000/2127

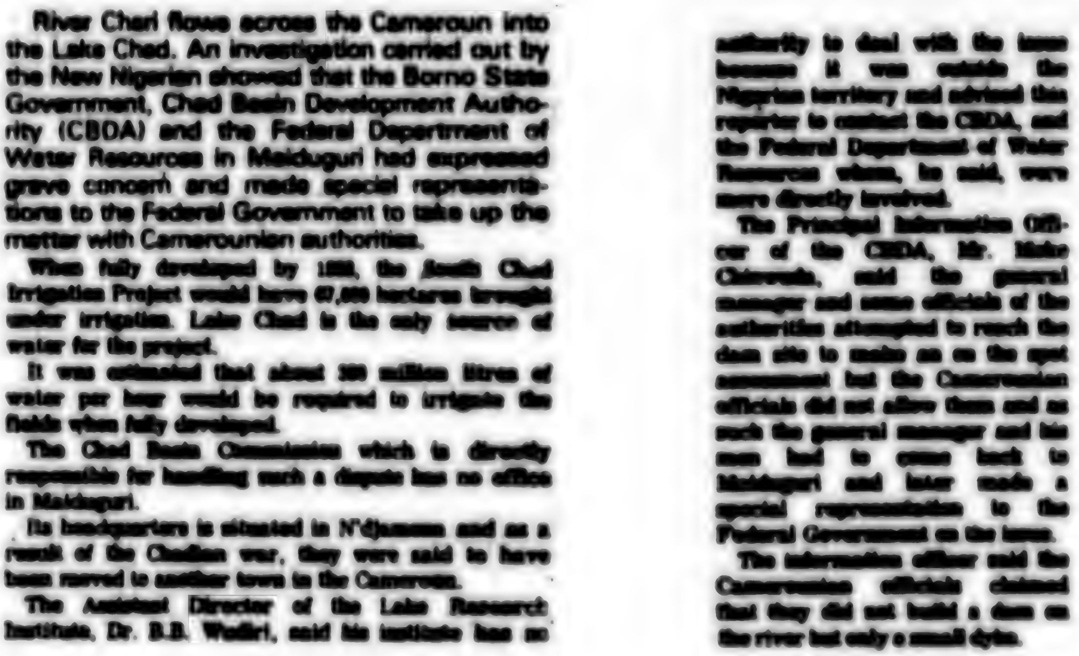
CAMEROONIAN 'SECRET' DAM CALLED THREAT TO NIGERIAN WATER

Kaduna NEW NIGERIAN in English 28 May 81 pp 1, 9

[Article by Sani Haruna]

[Text] Camerounians have constructed a dam on the Chari--a major river which accounts for about 75 percent of the waters that flow into the Lake Chad.

As a result, fear is being expressed that the largest irrigation project on which the Federal Government had spent over 200 million Naira would fail due to insufficient water to make it operational.



River Chari flows across the Cameroun into the Lake Chad. An investigation carried out by the New Nigerian showed that the Borno State Government, Chad Basin Development Authority (CBDA) and the Federal Department of Water Resources in Maiduguri had expressed grave concern and made special representations to the Federal Government to take up the matter with Camerounian authorities.

When fully developed by 1988, the South Chad Irrigation Project would have 67,000 hectares brought under irrigation. Lake Chad is the only source of water for the project.

It was estimated that about 300 million litres of water per hour would be required to irrigate the fields when fully developed.

The Chad Basin Commission which is directly responsible for handling such a dispute has no office in Maiduguri.

Its headquarters is situated in N'djamena and as a result of the Chadian war, they were said to have been moved to another town in the Cameroun.

The Assistant Director of the Lake Research Institute, Dr. B.B. Wudiri, said his institute has no authority to deal with the issue because it was outside the Nigerian territory and advised this reporter to contact the CBDA, and the Federal Department of Water Resources whom, he said, were more directly involved.

The Principal Information Officer of the CBDA, Mr. [illegible], said the general manager and some officials of the authorities attempted to reach the dam site to make an on the spot assessment but the Cameroonian officials did not allow them and as such the general manager and his men had to come back to Maiduguri and later made a special representation to the Federal Government on the issue.

The information officer said the Cameroonian officials claimed that they did not build a dam on the river but only a small dyke.

The officer in charge of the Federal Department of Water Resources was not on seat when I called there but a hydrologist who did not wish to comment confirmed that they were busy working on the dam issue.

At the Borno State Ministry of Agriculture, some officials claimed that construction of the dam by the Cameroonians had affected thousands of farmers and livestock in the eastern part of the state. The officials also confirmed that they had travelled right inside Cameroon and had seen where the dam was constructed. They said when the issue was raised earlier, the Cameroonians denied having built any dam.

A competent source said there are at least six dams under construction or soon to be constructed on various tributaries of the Lake Chad and if this is allowed to continue soon there won't be enough water in the Lake Chad and consequently the giant multi-million Naira SCIP would be a complete waste.

When fully developed by 1985, the SCIP will annually produce 200,000 tonnes of rice, 120,000 tonnes of wheat, 28,000 tonnes of seed cotton and in addition yield large quantities of sorghum, vegetables and fodder. Under the project over 16,000 families or 100,000 people would be involved in farming in the area.

It is reliably gathered that only Nigeria among the four-member countries of the Chad Basin Commission is making a reasonable development of the Lake Chad Basin.

It is being alleged in certain quarters that the Cameroonian action is an act of sabotage against our premier irrigation project.

CSO: 5000/5023

BRIEFS

SHOA REGION DROUGHT--Hossana (ENA)--Twelve adults and seven children have died as a result of severe drought situation and unknown number of others are suffering from dysentry and other diseases in the Bugi Locality of Katchabira District of Kembata-Hadiya Province, Shoa Region, that has been hit by severe drought. The death of the 19 persons occurred between April 9 and May 14 ensuing from severe drought that hit the arid lowlands of Bugi Locality in particular due to the failure of the "Belg" rains. An emergency Relief Coordinating Committee has been established following the visit to the drought-affected locality by the Assistant Administrator of Kembata-Hadiya Province, while the Provincial Relief and Rehabilitation Commission and the Ministry of Health personnel are continuing in providing food and medical help to the affected people. The Emergency Relief Coordinating Committee said there has been casualty of cattle from the drought in the severely hit area so far. [Text] [Addis Ababa THE ETHIOPIAN HERALD in English 21 May 81 p 5]

CSO: 5000/5021

ECONOMY OF ONITSHA SAID THREATENED BY EROSION

Lagos DAILY TIMES in English 26 May 81 p 7

[Article by Chris Nwegbo]

[Text] The economy of Onitsha is being greatly threatened by an advancing erosion from the Ogboli-Umuosuma layout in the town.

The layout with a population of 5,000 people carries both the main power and water supply to the commercial town of Onitsha.

Already more than ten residential buildings and economic trees have been destroyed by the erosion that terminates at the nearby Nkisi stream, thus rendering about 100 persons homeless.

As a result of the erosion, one of the two main water pipes carrying water from the pumping station to the reservoir has become damaged while the fate of the second might be determined during the next rainy season.

Collapse

The situation has worsened the already acute water supply in the town and the imminent collapse of the second pipe might bring about the end of pipe borne water supply to Onitsha. Furthermore, the entire town might be hit by a total blackout resulting from the collapse of electric poles within the erosion area.

These electric poles if allowed to collapse could endanger the lives of residents within the area.

The Ogboli-Umuosuma residents have already appealed to both the Federal and Anambra State governments to rescue them from "this menacing natural disaster." The three-year-old erosion now over 90 ft wide, 100 ft deep and 500 ft long ranges at the rate of about 10 metres per rainfall.

Some of the institutions on the disaster area include the oldest Roman Catholic Teacher Training College in the former eastern region, St Charles College and the nearby St. Mary's Catholic Church.

A spokesman of the Ogboli-Umuosuma landlords, Akunwafor Ifeanyi Onwordi said that the next house to be swallowed by the erosion "is only 172 ft away to be followed by mine." Mr Onwodi said they had lost hope over their landed property which now lie at the mercy of the erosion.

He appealed to the Federal Government to come to their rescue before it was too late, adding that the state government could not cope with the situation.

One of the affected landlords, a retired civil servant, was said to have attempted to plunge into the gully for losing his only landed property to the erosion.

Meanwhile, other residents of the layout are known to be making arrangements to secure alternative accommodation before the final deluge.

CSO: 5000/5023

STORMS CAUSE HEAVY PROPERTY LOSSES

Gongola State

Kaduna NEW NIGERIAN in English 28 Apr 81 p 32

[Article by A. B. Tapidi]

[Excerpt] HUNDREDS of people have been rendered homeless sequel to violent rainstorms in five local government areas of Gongola State.

The local government areas affected are: Numan, Mayo-Belwa, Fufore, Guyuk and Yola, the state capital. No death has been reported so far.

Investigations showed that during the heavy rainfall, residential houses, churches, mosques, social centres, offices, stores, market stalls and other valuable properties were destroyed.

Similarly damaged by the violent storms are text-books, and exercise books, writing materials, furniture and other valuable household and schools' properties.

The total cost of damage and the number of people rendered homeless are yet to be known.

In Numan Local Government which was worst affected by the storm, residents of both the GRA and low-cost houses, the central business district, some institutions of learning and other local settlements have had unpleasant experiences since the beginning of this season.

All the post-primary institutions and staff quarters as well as most of the primary school classrooms and adult education centres have been affected by the heavy storms.

Power supply had become most irregular because some of the electric poles had been pulled down. Telephone and telex services had been drastically affected particularly in the state capital.

Scarcity of water supply is now noticeable in some parts of the affected areas because a number of overhead water tanks had been blown off and some generating engines affected.

The chairman of the Numan Local Government Management Committee, Mr. Enan Tada, described the situation as "a serious natural disaster" which needed the immediate assistance of both the federal and state governments as a matter of urgency.

Sokoto State

Kaduna NEW NIGERIAN in English 5 May 81 p 24

[Article by Adebisi Adekunle]

[Text] ONE person had one of his ear chopped off while another one received a deep cut on his head and hundreds of people were rendered homeless as a result of rainstorm that swept through Kofar Marke Ward in Sokoto State capital yesterday.

The rainstorm which started about 3.30 p.m. also destroyed two cars and properties worth thousands of Naira.

Private houses, hotels, mechanical workshop and the Federal Savings Bank had their roofs blown off by the storm.

When the New Nigerian visited the scene of the incident the inhabitants of the area were seen packing their belongings to their relatives' residence while others were packing to their neighbours who were not affected by the rainstorm.

The inhabitants were also seen clearing the debris left by the storm while others were seen rushing to buy thatches to cover their roofs.

The injured victims who were rushed to Sokoto General Hospital for treatment were said to have received the injuries through flying zinc from one of the house affected by the rainstorm.

One of the inhabitants told the New Nigerian that the rain was preceded by storms for about 10 minutes.

He said the rain, when it started, was accompanied by a more powerful storm and last only 15 minutes.

Cross River State

Kaduna NEW NIGERIAN in English 6 May 81 p 9

[Article by Gregory Umari Mgbado]

[Text] PROPERTY worth one million Naira were destroyed when rainstorm blew off over 100 buildings in Ogoja Local Government area of the Cross River State.

Over 2,000 people were rendered homeless as a result of the rainstorm that swept the local government area last weekend.

The most affected area was Okuku where about 50 houses were destroyed, rendering over 1,000 people homeless.

At the Mary Knoll Secondary School, six staff quarters, two domitories and the administrative block were destroyed. Electric poles in the school were also removed.

Narating his experience, a tutor in the school, Mr. Euname Ishabori, said he was grateful to God that the incident happened when school children were on holidays.

Mr. Ishaber said if this incident had happened when the children were in school, many of them could have suffered serious injuries, as a tree fell across one of the dormitories in the school, dividing it into two.

At Abakpa, the story was the same. Over 15 houses were affected. Some houses caved in and others had their roofs removed.

Two community leaders who talked to the press later, said the incident took place at about 8 p.m. last Thursday night when most of the affected families were about to go to bed.

CSO: 5000/5020

NIGERIA

STORMS, DROUGHT DESTROY PROPERTY IN BAUCHI

Nearly 2 Million Affected

Kaduna NEW NIGERIAN in English 29 May 81 p 1

[Article by Yaro Ali]

[Text] More than 349 million Naira worth of cash crops were destroyed in Bauchi State as a result of the drought scourge that ravaged some parts of the state last year.

This was contained in a comprehensive report on the effects of the drought compiled by the Produce Division of the state's Ministry of Agriculture released in Bauchi yesterday. As a result of the drought the report said, more than 22 percent of the farmers in the state estimated at 1.7 million were affected.

The report said that the amount involved—349,980, 242 Naira—was about 38 per cent of the estimated total production in the state last year.

In the report, the state government categorised the areas affected by the drought as follows:

(1) Seriously affected local government areas which incurred a total loss of up to 50 per cent were Misau, Katagum, Shira, Dukku and Ningi. (2) areas with 42 per cent loss which were classified as moderately affected were Darazo, Gamawa, Jama'are, Akko Tangale Waja, Bauchi and Gombe, while (3) Dass, Tafawa Balewa and Toro local government areas which were considered as partially affected areas had a total of eight per cent loss each.

The state government had decided to distribute 20,280 bags of guineacorn, 7,500 bags of millet and 1,333 bags of maize to the people of the affected areas free of charge, while 10,125 bags of guineacorn, 3,750 bags of millet and 668 bags of maize were sold at subsidised rates to the people of the areas.

In addition the government has made available 8,125 bags of unshelled groundnuts, 1,000 tonnes of cotton seed cake, 500 tonnes of groundnuts cake, 680 tonnes of soya-beans cake and 1,500 bags of salt licks to all the people in the areas.

Meanwhile the Federal Government has given a grant of three million Naira to the people of the drought affected areas while the state government gave its own contribution of one million Naira for the same purpose.

Subsequently the state government had appointed a committee which deliberated on the best way the said amount of money could benefit the farmers in all the drought affected areas of the state.

Property Worth Thousands

Kaduna NEW NIGERIAN in English 30 May 81 p 9

[Text]

A NUMBER of dwelling houses and valuable property worth thousands of Naira were destroyed as a result of rainstorm in Bauchi State capital last weekend.

The rains described as the heaviest since the beginning of the current rainy season, lasted about two hours.

A report from Bauchi said as a result of the rains, it became very difficult for motorists to pass through some roads in the town.

The report added that the rain had also damaged some electric poles as a result of which many area within the state capital remained without electricity for several hours.

Meanwhile, farmers are now busy in their farms and those who took the advantage to cultivate their farms at the early rains were similarly busy checking the areas that needed immediate touch.

CSO: 5000/5023

NIGERIA

GORONYO DAM TO DISPLACE 29,000 PEOPLE

Kaduna NEW NIGERIAN in English 22 May 81 p 24

[Article by Ibrahim N. Salihu]

[Text]

MORE than 29,000 people are to be displaced by the construction of the [illegible] million Naira Goronyo Dam in Wurno Local Government of Sokoto State.

This was disclosed to the New Nigerian by the state Commissioner for Resettlement and Rehabilitation, Alhaji Maccido Gandi, during an interview in his office.

He said arrangements have almost been completed to resettle the affected people in six new settlement sites.

Alhaji Maccido Gandi said the settlements were chosen jointly by officials of his ministry, those of the Sokoto River Rima Basin Development Authority (SRRBDA) and a cross section of the villagers to be affected by the exercise.

He said the selected settlements include (a) Rima site in Goronyo district of Wurno Local Government, (b) Sabon [illegible], (c) Gidan Tsaba, (d) Tsamaye, (e) Mashe-karin Kwaidada all in Sabon Birni Local Government and [illegible] Resettlement Site in Gada Local Government area.

The commissioner said a census was conducted recently to determine the population in 37 towns and villages needing resettlement.

Alhaji Maccido Gandi said the government had planned to create a single town for them to enable them to benefit from an [illegible] electricity and water supply.

He said the cost of the whole exercise depended largely on the "compensation philosophy" and SRRBDA. "That is we either build the houses for them or give them money to do so."

He disclosed that his ministry which came into existence this year had been experiencing problems, particularly staff shortage. He said more efforts were however being put in to solve them.

CSO: 5000/5023

PROPOSED DAM TO DISPLACE 70,000 PEOPLE

Kaduna NEW NIGERIAN in English 30 Apr 81 p 24

[Article by Mohammed Salau]

[Text]

THE proposed 1.2 billion Naira Makurdi hydro-electric project dam in Benue State will displace a total of 70,000 people and affect 400 houses and hamlets in Benue, Gongola and Plateau states.

Among the areas to be completely submerged by the dam are the ancient and historical Abinsi village which was the first administrative headquarters of the old colonial administration in the former Benue Province and some villages on the bank of Benue River from the two other states.

Answering these to Governor Aper Aku and the Minister of Mines and Power, Alhaji Mohammed Ibrahim Hassan, while conducting them round the project site at the outskirts of Makurdi last weekend, the Director of Civil Engineering, Mr. J.C. Umeh, assured that all those affected by the project would be adequately compensated and resettled.

He announced that the National Electric Power Authority (NEPA) workers on the project would be provided with a colony-type of quarters with good access roads within the colony, the project and the resettlement areas of the displaced people as in Jebba and Shiroro hydro-electric dam projects.

The 10.3 kilometres wide dam, when fully functional, the director hinted, would generate 1,000 megawatts of electricity and stimulate power supply to the industrial, economic and social sectors in Benue State and other parts of the country. Mr. Umeh also hinted that the project would provide job opportunities for a large number of people in Benue State.

Making an observation on the project, Governor Aku expressed concern at the way the issue was made without consultation. He also emphasised the need to re-schedule the project and shift it from the present site because of the danger and the risk the dam posed to the lives and property of the people of Makurdi township and all the area surrounding the River Benue.

Replying, the Minister of Mines and Power, Alhaji Ibrahim Hassan, regretted the lack of information from the former military administration to the state government on the establishment of the proposed dam and gave the assurance that his ministry would not only bridge the communication gap but would take every necessary precaution on the project to allay the fears of the people and the government of the state by way of compensation, provision of farmlands to displaced farmers and job opportunities.

CSO: 5000/5020

ZIMBABWE

DISCUSSION OF DDT DANGERS 'ALARMING'

Salisbury THE SUNDAY MAIL in English 31 May 81 p 14

[Editorial: "Eating Poison"]

[Text] For some considerable time this newspaper has been drawing attention to the use of DDT, now banned in many countries, as a pesticide, with its consequent proven damage to the environment.

Last week ZBC-TV broadcast a panel discussion between five of the foremost authorities in the country, a discussion that was as alarming as it was brilliant.

DDT breaks down into two compounds, DDD and DDE, both of which remain in the ecosystem for an as yet undetermined period of time. It is known that life systems in our rivers and lakes are carrying a greater concentration of these chemicals than existed in Britain, America and Europe when the dangers were recognised and the pesticide proscribed.

At the moment the chief victims, the endangered-species, seems to be the birds of prey. The panel estimated that the fish eagle, for example, would be extinct in this country in 10 to 15 years, some falcons in even less time.

One might ask, in selfish terms: Does the fish eagle, or other bird, matter that much, does their existence justify the outcry and cost of using more expensive but less dangerous chemicals in pest control? Indeed it does.

One of the panelists summed up the issue when he said we were getting warning signals from the environment: we are pouring into the ecosystem a chemical whose end products are placing some species in jeopardy, in line for extinction.

Let it not be forgotten that man, too, is part of the animal kingdom, and in terms of the life chain, is dependent upon the rest. Already our food supply, be it grain, meat, eggs or milk, is contaminated by these chemicals, which accumulate and ultimately end up in our own bodies. We are eating poison, and the consequence of that is not a matter for conjecture.

Through the threat to the existence of other forms of life, is it not now time for us to heed the warning signals and seek other means of controlling insect pests? Let the authorities review the matter with the urgency it deserves and act before we do irreversible damage to our own existence and wellbeing.

CSO: 5000/5016

ADVANCES MADE IN EARTHQUAKE PREDICTION

Moscow KRASNAYA ZVEZDA in Russian 8 Mar 81 p 4

[Article by O. Bobrakov, major engineer, correspondent of KRASNAYA ZVEZDA: "Can We Forecast an Earthquake?"]

[Text] A commission gathers every Wednesday at 10:00 in Tashkent. It reports on the seismic situation in the region and predicts the earthquakes for the week, the next days and for the future. Fantasy, a simple waste of time? Not at all.

As long as mankind can remember, earthquakes have been one of his most insidious enemies. At depths at times of tens and hundreds of kilometers, the depths of the earth accumulate, and then spontaneously release energy that is commensurate with the power of a dozen nuclear bombs exploding. This element destroys human lives and enormous material valuables. Since the beginning of our century alone about a million people have died in earthquakes.

It is thought today that every other person living on the planet is in a zone that in principle is exposed to underground storms. Earthquakes with strength of seven and more points can occur on one-tenth of the territory of our country. One-fifth of our territory, where over 50 million people live, can be exposed to six-point jolts.

The earth is shaken several hundreds of thousands of times every year. Some jolts are only recorded by the most sensitive instruments that are now capable of recording soil fluctuations with amplitude of only millionths of a millimeter. But cases are not uncommon where the teletypes after an earthquake distribute to the world reports that are full of dramatism.

What if we knew beforehand when, where and with what force the underground storm will occur! What misfortune we would succeed in avoiding! But how can a fairly accurate prediction be made? The scientists know that earthquakes occur "without rhyme or reason." Some processes precede it, something accompanies it and something is the direct cause.

The behavior of animals, for example, confirms the presence of these processes. They sense the approach of an underground storm in a mysterious way. Certain fish are agitated and begin real dances even in an aquarium. Snakes, lizards and rodents leave their holes, and bears come out of their dens. Pheasants, geese and quail cry in alarm and pigeons take off into the air before the jolts. Pets seem to lose contact with nature, but they "give signals": cats leave the house, horses try to leave their stalls, and the dogs not only howl, but sometimes even try to pull their masters into the street.

What "warns" the representatives of the fauna? Not a mystical supersense. What then? The specialists sought an answer to this vitally important question under the earth, on the earth and even in space. They measured the velocity of dispersal of seismic waves, inclinations of the earth's surface, traced the development of cracks on the soil, probed the faults of the earth with radio signals and carefully recorded all the changes in the electromagnetic fields in the region of the earthquake foci. Working hypotheses were born as the results of experiments were accumulated. Some of them disappeared, hardly appeared, and others were partially accepted.

Say that a guess was made that tidal forces created by the moon and the sun become the impetus for the "discharge" of the strained depths. In fact, in a number of cases, the time of underground jolts coincided with the passage of a tidal wave. In a number of cases, but not in all. The tides alternate regularly, but the depths of the earth do not react so violently to each of them. In the end it was agreed that the tides can be a "release catch" for the explosion, but it is necessary to continue the search for more reliable indications of the element.

The experiments became more accurate and more advanced equipment for them was made. Thus, the scientists of the O. Yu. Shmidt Institute of Earth Physics of the USSR Academy of Sciences, the main institution in the country on seismology, conducted unique studies of the depths at the station "Pamir-1" with the help of impulses of MGD-generators [magnetohydrodynamic]. The latest equipment that was made by the specialists of the I. V. Kurchatov Institute of Atomic Energy and the Institute of High Temperature Physics for these purposes indicated that 2-3 months before the manifestation of the element, the so-called apparent electric resistance of the deep layers changes. In a word, fundamentally new methods penetrated seismology. Their fruitful influence was indicated at the 26th CPSU Congress.

At the same time the search continued. It was led by scientists of Moscow and Central Asia, Siberia and the Far East.

The colleagues of the Tashkent Institute of Seismology took another path. They were put onto this path by a bottle of ordinary Tashkent mineral water. Medical personnel constantly monitor its composition. Suddenly the radon content in the next sample increased. The sadly famous Tashkent earthquake began in roughly a day. What is this? A random coincidence? The director of the institute, hydrogeologist G. Mavlyanov and his colleagues could not by-pass the unexpected phenomenon. They were naturally interested in what happens to the chemical composition of the subsoil waters on the eve of underground storms.

The hydrogeologists began to drill wells to 2 kilometers depth, to take samples and to study the gas composition of the water. It turned out that in fact on the eve of earthquakes the radon content in water increases 2-4-fold and the content of carbon dioxide, helium, argon and other substances changes. This apparently occurs under the influence of the compressing forces that eject water saturated with trace elements from the pores of the beds. The changes increase, and suddenly drop drastically. Roughly within a day after the drop, wait for the earthquake.

The observations were made every day. The results were verified in the space of several years. The pattern was repeated in Issyk-Kul', in Makhachkal and other regions. Thus was born discovery No 129 that the chemical composition of underground water changes because of an earthquake. It seemed that the solution had been found, the most reliable criterion had been obtained. Unfortunately, this occurs rarely in science. There are new surprises at every step forward. This happened this time.

It was found that the gas concentration may not only increase, but also decrease. Why? The scientists "eliminated" this question also: everything depends on whether compression or stretching of the earth's crust is the source of the earthquake. In any case, after a sharp jump to the original condition, one should wait for underground jolts. Their strength can be judged by the size of the previous deviation.

It would seem that the pattern is clear. One can stop at the attained level, drill wells and obtain accurate predictions. This is clearer because there are a number of successful predictions known. The specialist would smile with such a formulation of the question. He knows that there is no best and single method that guarantees absolute accuracy. The totality and complex use of prediction methods that are different in nature are the guarantee of accuracy.

Five new methods of prediction out of the 11 known methods were developed by the specialists of the Institute of Seismology in cooperation with the scientists from other regions in the country. Here is one of their latest findings.

It had been noted for a long time that underground storms are accompanied by luminescence of the atmosphere, flares and aurorae boreales. Moreover, luminescence of electric lights was observed when they were turned off. Where does this come from? The first hypothesis regarding the presence of powerful electric fields in the depths, "underground storms" was advanced by Professor A. Vorob'yev of the Tomsk Polytechnical Institute. It was decided to check. A unique antenna was lowered to a depth of 500 meters. Before the increased seismic activity, the cable insulation was pierced. The equipment was improved and regular observation was set up.

Kakhor Nasirbekovich Abdullabekov who led this work, shows several typical curves that were drawn by the self-recorder. The number of impulses on them rose drastically each time 10 hours before a jolt. The physical nature of the fields is not yet known for certain. It is impossible to model under laboratory conditions all the factors that cause these fields. But the method of electromagnetic impulses together with others are already reliable for the seismologists.

Saying good-by to the director of the Institute of Seismology, I absent-mindedly glanced at the calendar. It was Tuesday. I could not help but ask the question: "Gani Arifkhanovich, what will be reported tomorrow?"

"Everything is not calm. For several years, elastic stresses have been accumulating under Tashkent. It is better when the depths are discharged more frequently but with lighter jolts. Since December of last year, the jolts have been fairly strong. Fifteen of them reached 5-6 points. By the way, we predicted this process. We will discuss an accurate prediction at the commission. There is no need to worry people in advance."

Having noticed my disappointment he added:

"Wait a little. Our science is advancing rapidly. We are making more accurate predictions. Errors are less frequent. The day is close when we will be able to announce with complete confidence that an earthquake is expected tomorrow. It is assumed to be four points."

The 26th CPSU Congress aims the workers of our science on directing their efforts to solving practical problems in addition to working out theoretical problems. The seismologists, like all the country's scientists, are responding to this requirement of the party with work.

9035
CSO: 5000/26

ACTIVE KURILE AREA VOLCANO STUDIED

Moscow TRUD in Russian 6 May 81 p 4

[Interview with V. M. Surgrobov, deputy director of the Institute of Volcanology by V. Tolstov, correspondent of TRUD, by telephone on 5 May 1981: "When the Volcano is Awakened"]

> [Text] A strong eruption of the highest volcano in the Kurile island arch, Alaida occurred on the island of Atlasov that is located in the northern Kurile chain. An expedition from the Institute of Volcanology of the Far East Scientific Center of the USSR Academy of Sciences flew to this region from Petropavlovsk-Kamchatka. Yesterday morning, when dawn was just beginning in Moscow and it was the middle of the working day in Kamchatka, our correspondent spoke on the telephone with the Institute of Volcanology. The deputy director of the institute, V. M. Surgrobov answered the phone.

[Answer] "The explosion of the volcano that has the shape of an almost ideal cone started on 28 April with a powerful explosion," he related. During the next 3 days, Alaid was very active. One of the strongest eruptions in recent years in the region of Kamchatka and the Kurile Islands occurred. The thunder of the explosions and the flames flying out of the crater were heard and seen by the sailors of passing ships and the residents of settlements many kilometers from the island of Atlasov. The volcano discharged an enormous quantity of ash into the atmosphere. According to preliminary data, the wind extended the ash tail a thousand kilometers. The strong ash-fall resulted in a disorder in radio communication in this region.

In the first hours of eruption, the colleagues of our institute flew over Alaid in an airplane. On 30 April the volcano began to quiet down. It became possible to land an expedition by helicopter on Atlasov Island. It reported that the eruption had stopped for now. The slopes of the volcano were covered with a 30-centimeter thick layer of ash. The entire island was covered with ash. Even at a distance of 100 kilometers from the crater, its layer was 5 centimeters.

[Question] Several years ago, the specialists of your institute succeeded in predicting very accurately the beginning of the explosion of the Tolbachik volcano. Did the volcanologists expect the excitation of Alaid?

[Answer] Constant observations were not made of Alaid, therefore the beginning of its eruption was unexpected. Now our expedition is setting up an automatic seismic station in the region of the volcano. It will permit constant tracking of Alaid's behavior. As a rule, a series of small earthquakes that are recorded by instruments precede the beginning of the explosion. One can determine the beginning of the excitation of the volcano from their readings.

[Question] Did the eruption of Alaid cause any damage to the population of the nearby cities, settlements and nature?

[Answer] According to the available data, there were no victims or destruction from Alaid. However, the products of an explosion that are discharged into the atmosphere to a height of tens of kilometers. fell on an enormous area. The streets and houses of North Kuril'sk were covered with a 15-centimeter layer of volcanic ash. It polluted the reservoirs from which the city gets its drinking water. The ash fell on different populated areas of Kamchatka and in the sea in the regions of commercial fishing. There is no special danger for man or nature in this. The majority of chemical compounds that are contained in ash are harmless. Moreover, they serve as fertilizer for the plants. Pollution of the atmosphere with products of volcanic activity does not last long.

It is now difficult to say whether Alaid has fallen asleep again for several years, or whether the eruption will last for a certain time. The expedition of the institute on the "Vulkanolog" ship is sent from day to day to the region of Atlasov Island. Observation of the volcano continues.

9035
CSO: 5000/26

START OF USSR SEA STUDY PROJECT ANNOUNCED

Moscow PRAVDA in Russian 12 May 81 p 3

[Article by A. Androshin: "The Seas Await the Scientists"]

> [Text] Guarantee of further development of resources and protection of the marine environment will be promoted by complex hydrometeorological studies of the seas of the Soviet Union and the shelf zone. This is the work that has been started in our country. News of this came from the State Oceanographic Institute of the USSR State Committee on Hydrometeorology where a unique headquarters has been set up of a new scientific program that has been called Project USSR Seas.

The publication of this project involuntarily suggest the question: are our seas really so poorly studied? It seems that for a long time there have not been any white spots on the map.

However, the specialists assert not without grounds that the information that they have is already insufficient for further development of biological and mineral resources of the marine environment, as well as its effective protection. The hydrometeorological and hydrochemical regime of the seas that wash the territory of our country has noticeably changed in recent years. Here the influence of both natural factors and the economic activity of people has been noticeable. New, and sometimes more detailed data are needed on individual water areas.

"The work of such scale as the Project USSR Seas will be done for the first time in the country," reported the director of the State Oceanographic Institute, F. S. Terziyev. "In a comparatively short time segment, we will have to conduct observations simultaneously on all our seas. What will this provide the scientists? In particular, they will be able to obtain more complete information regarding the hydrometeorological processes occurring in those regions, to try to understand their physical link better and to get to know the laws governing the formation of the regime of a certain marine environment.

The program of imminent studies includes numerous experiments that will be done by the shore teams and expeditions on ships equipped with special equipment. The sky above the water areas will be furrowed by flying laboratories. It is planned to use data of observations from space in the work as well.

SOLIGORSK MINE WASTES CONVERTED INTO MINERAL FERTILIZERS

Moscow PRAVDA in Russian 12 May 1981 p 3

[Article by I. Novikov, correspondent of PRAVDA: "Soligorsk Mountains Not Needed"]

> [Text] Soligorsk is visible from afar. The handmade mountains near the city are one of the remarkable details of this recently plain kray. They are made of rocks that the Belorussian miners are extracting from the depths. These miners are extracting sylvinite. This is a detail, directly speaking, that does not please the people. Soligorsk does not need these mountains.

The mountains of rock grow upwards and in width, occupying more rich land. The soils near Soligorsk are the most fertile in Belorussia. But this is not the only negative factor of the development of the potassium industry here. The extracted sylvinite is exposed to flotation treatment. The potassium concentrate is extracted from it while all the rest, called argillaceous-saline sludges, in the form of liquid clay and dense brine are discharged into the handmade lakes. The sludges contain and essentially lose up to 16-18% of the potassium salt. They unfortunately have a lot of chlorine sodium salts, but at the same time, sulfates of calcium, magnesium, sodium and potassium, as well as trace elements, manganese, zinc, cobalt, copper, nickel, magnesium, and an especially lot of iron. This is a warehouse of useful substances!

But now the sludges "conflict" with the environment. The subsoil waters carry the salts over the surrounding territory, turning the fertile lands into saline soils that are not suitable for farming.

How can this warehouse be utilized, how can the sludge be turned from harmful wastes into useful products? The Belorussian Academy of Sciences has set up a scientific council to formulate the scientific fundamentals to prevent salinization of the soils and the water sources with wastes of the Soligorsk potassium enterprises. It is headed by Academician of the BSSR Academy of Sciences G. V. Bogomolov. The scientists, biologists, chemists and physicists persistently searched for a solution to the important problem, and now one can state confidently that they found it.

The head of the laboratory of the Institute of Peat of the BSSR Academy of Sciences, Candidate of technical sciences A. V. Tishkovich offered an invitation to visit the experimental base of the institute.

"First we will look at the experimental unit to produce complex granulated fertilizers based on peat," he suggested.

The unit,built by the institute colleagues, is essentially a small factory. The components of future granules are stored in its preparatory section: phosphorus, nitrogen, peat and substitutes for the potassium salt of the sludge. The mineral raw materials are fed by mechanisms to a conveyer, and if necessary, are transmitted through a crusher. The peat is separated. Each component passes through a layer of the doser, from which it again goes to the conveyer, and then to the mixer. The mass further goes into a granulator. It is squeezed out of it in the form of macaroni. It falls onto a transporter and is fed into the dryer where it not only is dried, but also acquires a granular appearance. After passing through the cooler, they are poured into paper bags. Everything is the maximum of simplicity.

We see a number of familiar units in the technological chain. The granulator, for example, is a belt press to produce brick, SMK-21 that is series produced by the Mogilev plant "Strommashina." It only required a change in the nozzle of the grid. The drying uses a grain dryer connected to several drums. These and other units fit in the yard of the new industry.

"By making the complex granulated fertilizers based on ammoniated peat with argillaceous-saline sludges," explains A. Tishkovich, "we are simultaneously solving a number of economic problems. Environmental protection is improved and salinization of soils in the Soligorsk zone is drastically reduced. Millions of tons of potassium fertilizers that fall into the sludges are used. This is what the flotation method did not successfully remove from the sylvinite. In addition, when sludge is used for fertilizer, the fields are enriched with trace elements. But this is not all. Our technology of production of complex fertilizers makes it possible to regulate their composition with regard for the needs of each type of plant crop, as well as the physical-chemical and biological condition of the soils in a definite region."

Anatoliy Vasil'yevich together with the senior agronomist of the experimental base "Dukora" V. V. Kapskiy invited me to the sections where different types of fertilizers have already been tested in the field for 4 years. In the field house, on the table there were about 2 dozen glasses with samples of different granules that had been made on the experimental unit especially for potatoes, corn, winter and spring grains,perennial grasses and sugar beets. The content of nitrogen, phosphorous and potassium in them was dosed according to the needs of each crop. Granules of complex fertilizers were presented not only based on peat, but also shales and brown coal which have abundant deposits in Belorussia. All of them are also passing field tests.

Here we are at the experimental sections. Near each plot is a table with information on the type of fertilizers used for each crop. As the accounting documents indicate, the potatoes, the barley, the corn and the sugar beets with their rapid growth seemingly vote for the granules on the peat base that they were offered.

"Peat not only binds the fertilizer components," Anatoliy Vasil'yevich explains. "Before granulation, we activate it with ammonia. During the drying at a temperature of 80-90°, processes occur in it that considerably improve the efficiency of the fertilizers. We can thus achieve a better result than the biological, when the peat is transmitted through the livestock farms as bedding. It should also be noted that peat delays the dissolving by water of nitrogen, potassium and phosphorus. It feeds plants for 2-3 years. This also increases the effectiveness of the mineral fertilizers."

Similar experiments and with the same positive results have already been conducted by the Institute of Peat of the BSSR Academy of Sciences in a number of farms of the Pukhovichskiy region, and by the Belorussian Scientific Research Institute of Soil Science and Agrochemistry of the BSSR Ministry of Agriculture on the fields of the Lyakhovichi sovkhoz technical school and Lomonosov kolkhoz of the Lyakhovichskiy rayon.

"The soils are not salinized by your granules?" we ask A. Tishkovich.

"Not at all," he answers. First of all, there is not so much sodium chloride in the sludge and the fertilizers are not introduced in such a large quantity that the soil is salinized. Secondly, the sodium chloride, as is known, is easily dissolved and the atmospheric precipitation rapidly washes it away."

Now no one has any doubt that the complex organic-mineral fertilizers based on peat and argillaceous-saline sludge are needed by everyone: both the potassium workers and the rural toilers, and that their mass production is profitable. This is the conclusion of many organizations. The meeting of major specialists of the republic and economic workers unanimously approved the results of the work that was done by the scientists of the Institute of Peat. They advanced an opinion on the expediency of organizing in the 11th Five-Year Plan the production of granules based on sludge and dust fractions of the potassium fertilizers.

They all approved, but who will undertake to fulfill this recommendation. Who will become the master of this enterprise? An interdepartmental abyss was found.

The potassium workers reason as follows:

"The final product of the proposed enterprise is complex organic-mineral granulated fertilizers. This is no longer our department. Let the BSSR Ministry of Agriculture worry about its needs. As for the raw material for the granules, the sludge, collect any quantity of it, we will not object but will even say thank-you."

"Pardon," they object in the republic Ministry of Agriculture, "50-60% of the granules is sludge, while peat, supplied, by the way, by the BSSR Ministry of the Fuel Industry, only comprises 30-35%. Who must worry about the recovery of the sludge, we or the potassium workers?"

And in a lower voice they add:

"We will begin to manufacture the granules, but the Gosplan will cut off our supply of standard mineral fertilizers. At the same time, the standard weigh twice as little as the new, granulated fertilizers made on the basis of peat and sludge. This means that the demand for transportation vehicles will rise. It is better for someone else to be concerned about the innovation."

Who then? In Belorussia there is everything needed to organize the solid production of the new type of fertilizers: there is an abundance of agrillaceous-saline sludges and peat. Nitrogen fertilizers are produced in Grodno and phosphorus in Gomel'. It is only necessary to efficiently manage the wealth and wisely utilize it.

9035
CSO: 5000/26

BOOK ON ENVIRONMENTAL PROTECTION REVIEWED

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 3, Mar 81 pp 124-125

[Review by Dr of economic sciences A. Bulkin of book "Okhrana okruzhayushchey sredy i eye sotsial'no-ekonomicheskaya effektivnost'" [Environmental Protection and Its Socioeconomic Effectiveness], edited by Academician T. S. Khachaturov, Moscow, Nauka, 1980, 240 pp]

[Text] The problem of planning the efficient use of nature arises because of the acceleration of scientific and technical progress and the associated intensification and growth in the scales of production, and consequently, the developing ecological problems. This problem is currently attracting the attention of scientists, leaders of production and broad groups of the public.

The monograph under review examines a set of theoretical and practical questions of the socioeconomic effectiveness of environmental protection under developed socialism. The economic problems of ecology have been studied on the basis of the Marxist-Leninst theory regarding the role of the environment in the development of society. The authors study the interrelationships of society and nature under conditions of intensified modern social production with regard for the effect of the economic growth factors on the final national economic goals that are defined by the plan for socioeconomic development of the country. The economic features of the development of labor resources, means of production and dynamics of the environment are analyzed from the position of efficient use of nature.

The work gives a significant place to criticizing the bourgeois theories of the "global ecological catastrophe" whose main concept is the negative influence on the environment of the growth of the population, urbanization and industrialization. The incapacity of the capitalist system to resolve the contradictions between society and nature based on state monopolistic regulation of the economy is convincingly proved by the authors of the book in the example of the unreality of the legislative and administrative measures on environmental protection that do not touch upon the fundamentals of private ownership of the land, natural resources, tools and means of production.

An environmental-preserving type of expanded reproduction is inherent to the production relationships of matute socialism. It is based on public ownership of the means of production, natural resources and systematic development of the economy secured in the USSR Constitution. The monograph correctly notes that under conditions of planning, reproduction of natural resources itself becomes the object of the plan.

The systematic development of productive forces under socialism creates the conditions for an economical attitude towards the environment that takes into consideration the long-term needs of production. The authors reveal the dynamics for the use of mineral-raw material, forest, water and other resources in the 10th Five-Year Plan during the implementation of measures of scientific and technical progress and environmental protection. These measures include effective methods of extraction, refining and reproduction of minerals based on intensification of production, reduction in the harmful effect of wastes on the environment, increase in the efficiency of capital investments to develop new natural resources and have the maximum recovery of domestic wastes. Especial attention was given to economic problems of increasing the fertility of soils, protecting them from water and wind erosion and salinization, and recultivation of lands after mining and industrial working.

There is practical importance in the authors' opinion on the economic outlook for the use of natural resources in the limits of the continental shelf. Technical progress, increase in material potentialities of society significantly alter our ideas regarding the useful volumes and shortage of the majority of types of raw materials used in material production. Technical progress, for example, broadens society's potentialities for farming land sections in the economic turnover by improving their fertility, filling in ravines, using slopes, dessicating swamps, deoxidizing saline soils, etc.

The material potentialities of society make it possible to implement this work on industrial scales. Here the cost characteristics of an agricultural product that is obtained from less and more fruitful lands can be compared. The economic essence of perfecting the mechanism to control the involvement of natural resources in the economic turnover is based on the acknowledged presence in the society of developed socialism of a differential rent. The authors note correctly that the development of differential rent in the use of natural resources is governed by differences in the efficient use of them in production, the location in relation to the regions of consumption, etc. Consequently, the same current, one-time labor outlays for the use of natural resources of varying quality result in unequal national economic results.

The book sets aside a lot of space for economic problems of water consumption. It is stressed that the efficient control of water management objects under modern conditions must be based on the broader use in planning of water management of economic indicators and the cost accounting use of water resources and the main funds of water management purpose. It is noted that there is an objective need to reconstruct the economic mechanism for interrelationships of water management with the production sectors that are served. They must not be based on the active system of fines for the discharge of untreated waters, and on the use of effective circulating systems of water supply that take into consideration the progressive trends of water consumption in the national economic sectors in the future.

An undoubted advantage of the book is not only the national economic, but also the cost accounting estimate of the efficient use of natural resources with regard for the environmental protection measures. The highly profitable enterprises that have additional profit will be those where the maximum difference is attained between the individual and public cost of the products. It is expressed as the differential rent obtained with the use of the relatively best natural resources.

Ways are shown to improve the profitable use of resources by means of scientific and technical progress, organization of production, conducting environmental protection measures and perfecting the economic mechanism. For example, the efficient use of forests makes it possible to increase the production of commercial lumber, reduce the area of forest cutting, involve soft-sheet lumber in production, and set up the use of wastes in the form of splint-slab, wood-fiber boards, laminated plywood and sulfate cellulose.

Study of the socioeconomic problems of the use of nature leads the authors to the conclusion that it is necessary to have economic substantiation for the environmental quality standards. The nature conserving function of such standards is subordinate to the long-term national economic goal of guaranteeing high quality of life of the future generations. Decrease in the degree of pollution of the environment promotes a decrease in the morbidity of the population, improvement in the conditions of its work and rest, and consequently, reflects the social effect of environmental protection. Analysis of the economic consequences of achieving social results permits the authors to methodically correlate the expenditures for environmental protection with their efficiency in the sphere of social insurance, medicine and production.

The work presents rich factual material that permits a graphic presentation of the economic problems of environmental protection and an understanding of the objective need to solve them under conditions of the current intensification of production. The scope of the topic coverage is one of the advantages of the book. It analyzes the experience of cooperation of the socialist countries in developing a complex program of environmental protection measures.

However, one could suggest to the group of authors that there be a more complete working out of the questions of stimulating environmental protection work by additional profit received on the basis of differential rent.

On the whole, the book is written in an interesting style. It provides a new idea about the role of economic factors in environmental protection. It can be used in the practice of planning. It is expedient to recommend it to a broad circle of readers.

COPYRIGHT: Izdatel'stvo "Ekonomika". "Planovoye Khozyaystvo". 1981

9035
CSO: 5000/28

END

END OF
FICHE
DATE FILMED
June 26, 1981